ORDER NO. TD7904-046

Service Manual

Radio

RF-504

FM/AM PORTABLE RADIO

■SPECIFICATIONS

Frequency Range:	FM 88~108 MHz
	AM 525~1605 kHz (571~187m)
Intermediate Frequency:	FM 10.7 MHz
	AM 455 kHz
Sensitivity:	FM 3μV for 50mW Output
	AM 60μV/m for 50mW Output
Batteries:	3V (Two "AA" Size Penlight Batteries)
	(National UM-3 or equivalent)
Speaker:	6.5cm(2½") PM Dynamic Speaker
Dimensions:	77 (wide) × 133 (high) × 40 (deep) mm
	(3½" × 5¼" × 1$^{19}/_{32}$")
Weight:	250g(8.4 oz) without Batteries
Impedance:	Speaker·····8Ω
	Earphone Jack·····8Ω

Specifications are subject to change without notice.

■TO REMOVE CHASSIS

1. Remove the battery cover.
2. Remove the cabinet back cover in the direction of arrow as shown in Fig. 1.
3. Pull out the PC Board in the direction of arrows as shown in Fig. 2.
4. To reassemble, reverse the above procedure.

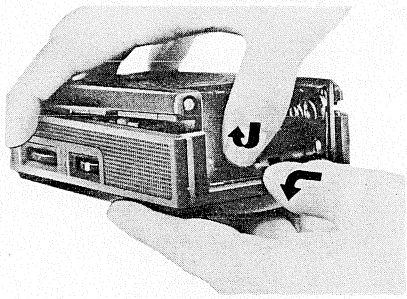


Fig. 1.

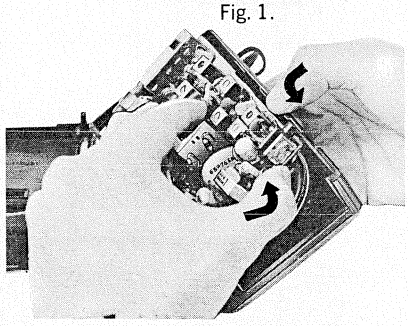
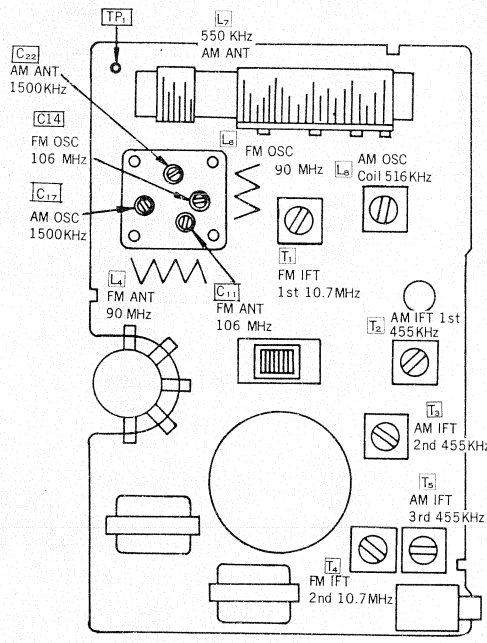


Fig. 2.

■ALIGNMENT POINTS



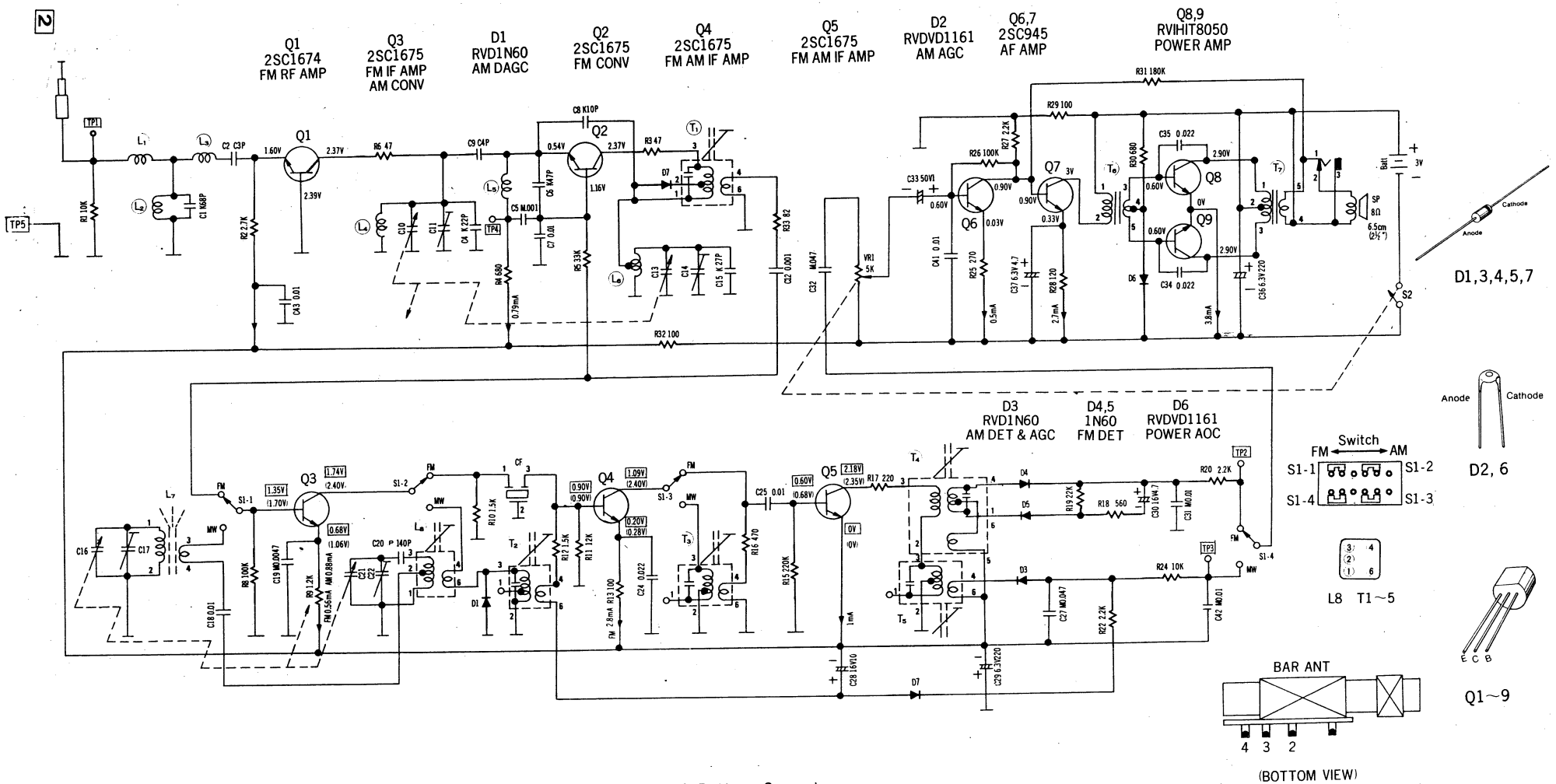
Alignment Points

Fig. 3.

National Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

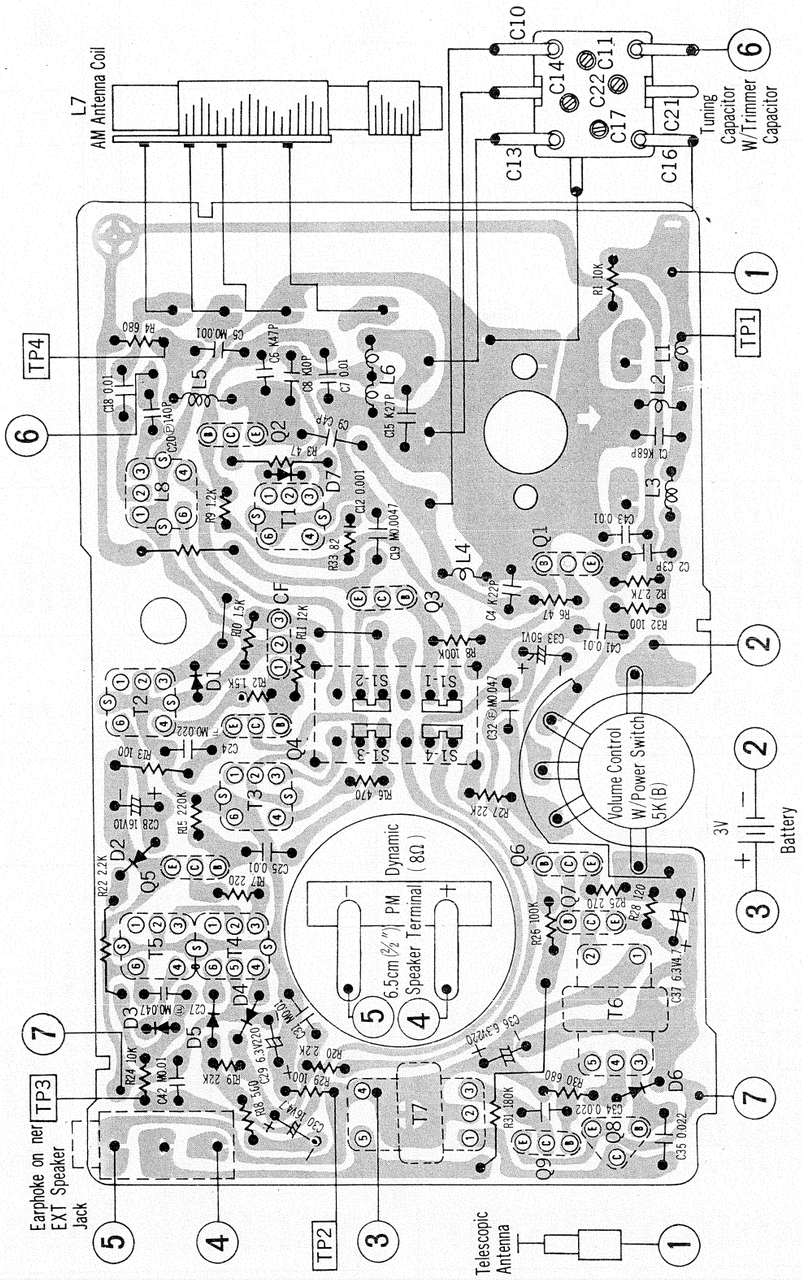
Schematic Diagram Model RF-504



NOTES: 1. S_{1-1}, S_{1-4}: Band Selector Switch in "FM" Position.
2. S_2 : Power Switch in "OFF" Position.
3. DC Voltage measurements are taken with circuit tester 10KΩ/V from negative terminal of battery
□ ·····FM Position ( ) ····AM Position

4. Battery Current
No Signal ····· 20mA
Maximum Output ····· 200mA

Circuit Board Wiring View Model RF-504



Q_1	FM
C	2.37V
B	2.39V
E	1.60V
Ie	0.59mA

Q_2	FM
C	2.37V
B	1.16V
E	0.54V
Ie	0.79mA

Q_3	AM
FM	2.40V
C	1.74V
B	1.35V
E	0.66V
Ie	0.56mA

Q_4	AM
FM	2.40V
C	1.09V
B	0.90V
E	0.20V
Ie	2.80mA

Q_5	AM
FM	2.35V
C	2.18V
B	0.60V
E	0 V
Ie	1 mA

Q_6	0 V
C	0.90V
B	0.90V
E	0.03V
Ie	0.50mA

Q_7	0 V
C	3.00V
B	0.90V
E	0.33V
Ie	2.70mA

$Q_{8,9}$	0 V
C	2.90V
B	0.60V
E	0 V
Ie	3.80mA

■ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Notes: 1. Set volume control to minimum.
2. Set band switch to AM or FM.
3. Set power source voltage to 3 volts DC.
4. Output of signal generator should be no higher than necessary to obtain an output reading.

	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
	AM ALIGNMENT					
(1)	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400Hz	Point of non-interference. (on/about 600 kHz)	Output meter across earphone jack.	T_2 (1st IFT) T_3 (2nd IFT) T_5 (3rd IFT)	Adjust for maximum output.
(2)	〃	550 kHz	550 kHz [Fig. 4]	〃	L_8 (OSC Coil) (*1) L_7 (ANT Coil)	Adjust for maximum output. Adjust L_7 by moving coil bobbin along ferrite core.
(3)	〃	1500 kHz	1500 kHz [Fig. 4]	〃	C_{22} (OSC Trimmer) C_{17} (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3)
	(*1) Cement antenna bobbin with wax after completing alignment.					
	FM-IF ALIGNMENT					
(4)	High side thru. 0.001 uf to point TP4 Common to point TP5	10.7 MHz (400 Hz SWP.)	Point of non-interference. (on/about 90 MHz).	Connect vert. amp. of scope to point TP2 Common to point TP5	T_1 (FM 1st IFT)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to fig. 5)
(5)	〃	〃	〃	〃	T_4 (FM 2rd IFT)	Adjust T_4 so that 10.7 MHz marker appears at the center. (Refer to fig. 6)
	FM-RF ALIGNMENT					
(6)	Connect to point TP1 through FM Dummy antenna. Common to point TP5 (Refer to fig.7)	90 MHz	90 MHz [Fig. 4]	Output meter across earphone jack.	L_6 (FM OSC Coil) L_4 (FM Tuning Coil)	(*2) Adjust for maximum output.
(7)	〃	106 MHz	106 MHz [Fig. 4]	〃	C_{14} (FM OSC Trimmer) C_{11} (FM Tuning Trimmer)	(*2) Adjust for maximum output. Repeat steps (6) and (7)
	(*2) Proper tuning is the center frequency.					

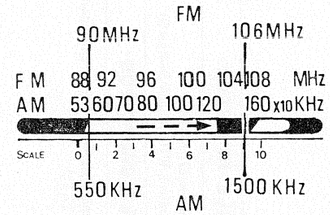


Fig. 4

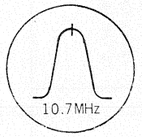
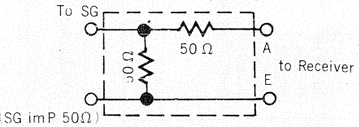


Fig. 5

Fig. 6



FM Dummy Antenna

Fig. 7

■CABINET PARTS LOCATIONS

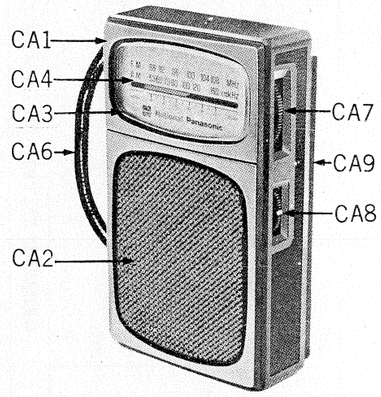


Fig. 8

■REPLACEMENT PARTS LIST ..... Model RF-504 (TD7904-046)

No TES: 1. Part numbers are indicated on most mechanical parts. please use this number for parts orders.
2. The Ⓢ mark is serivce standard parts and may differ from production parts.
3. The ○ mark is used by the manufacturing plant only.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
TRANSISTORS AND DIODES				
Q1	2SC1674	Transistor(Si), FM RF Amplifier	1	
Q2, 3, 4, 5	2SC1675	Transistor(Si), Converter & FM IF Amplifier AM Coverter & FM AM IF Amplifier	4	
Q6, 7	2SC945	Transistor(Si), AF Amplifier	2	
Q8, 9	RVIHIT8050	Transistor(Si), Power Amplifier	2	
D1, 3, 4, 5, 7	RVD1N60	Diode(Ge), AM DAGC & AM Detector & AGC & FM Detector & FM AGC	5	
D2, 6	RVDVD1161	Diode(Si), Power AOC	2	
CERAMIC FILTER, COILS AND TRANSFORMER				
L4	RLD4Y44	Coil, FM Antenna	1	TAMACO
L6	RLO4Y43	Coil, FM Oscillator	1	
L7	RLF2I49	Coil, AM Antenna	1	
L8	RLO2B100	Coil, AM Oscillator	1	
T1	RLI4B154	IFT, FM 1st	1	
T2, 3	RLI2B157	IFT, AM 1st & 2nd	2	
T4	RLI4B514	IFT, FM 4th	1	
T5	RLI2B457	IFT, AM 3rd	1	
T6	RLT3D16	Input Transformer P: 2KΩ, S: 3KΩ	1	
T7	RLT2D17	Output Transformer P: 50Ω, S: 8Ω	1	
CF	RVFCF10S12F	Ceramic Filter	1	
VARIABLE RESISTOR				
VR1	RVV53D74-B	Variable Resistor, 5KΩ(B), Volume Control W/ON-OFF Switch(S)	1	
VARIABLE CAPACITOR				
CV10, 13 16, 21	RCV4ZE2L	Tuning Capacitor, W/Trimmer Capacitor (CT11, 14, 17, 22)	1	TAMACO

■CABINET PARTS LOCATIONS

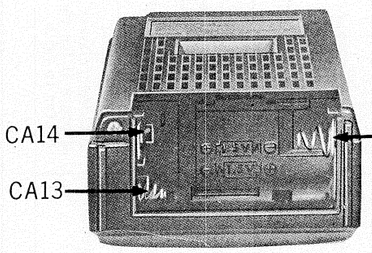


Fig. 9

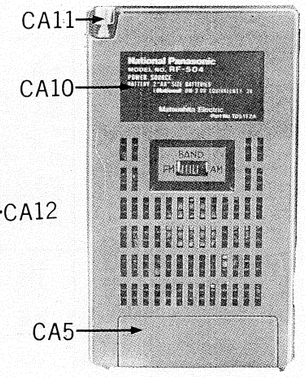


Fig. 10

■CHASSIS PARTS LOCATIONS

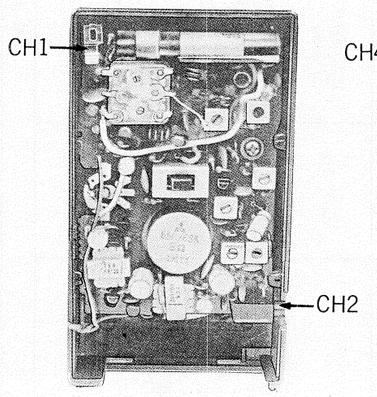


Fig. 11

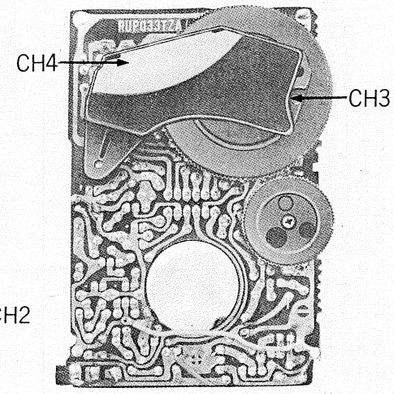


Fig. 12

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
SPEAKER				
SP	EAS65P76SK	6.5cm(2½″) PM Dynamic Speaker, Imp 8Ω	1	TAMACO
SWITCH				
S1-1～1-4'	RSS2D04Z-H	Switch, Band	1	TAMACO
RESISTORS				
R3, 6	ERD25JT470	47Ω, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R33	ERD25JT820	82Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R13, 29, 32	ERD25JT101	100Ω, ¼ Watt, ± 5%, Carbon	3	Ⓢ
R28	ERD25JT121	120Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R17	ERD25JT221	220Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R25	ERD25JT271	270Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R16	ERD25JT471	470Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R18	ERD25JT561	560Ω, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R4, 30	ERD25JT681	680Ω, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R9	ERD25JT122	1.2KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R10, 12	ERD25JT152	1.5KΩ, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R20,22,27	ERD25JT222	2.2KΩ, ¼ Watt, ± 5%, Carbon	3	Ⓢ
R2	ERD25JT272	2.7KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R1, 24	ERD25JT103	10KΩ, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R11	ERD25JT123	12KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R19	ERD25JT223	22KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R5	ERD25JT333	33KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
R8, 26	ERD25JT104	100KΩ, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R1, 31	ERD25JT184	180KΩ, ¼ Watt, ± 5%, Carbon	2	Ⓢ
R15	ERD25JT224	220KΩ, ¼ Watt, ± 5%, Carbon	1	Ⓢ
CAPACITORS				
C2	ECCD1H030C	3PF, 50WV, ±0.25PF, Ceramic	1	
C9	ECCD1H040C	4PF, 50WV, ±0.25PF, Ceramic	1	
C8	ECCD1H100KC	10PF, 50WV, ±10%, Ceramic	1	
C4	ECCD1H220KC	22PF, 50WV, ±10%, Ceramic	1	
C15	ECCD1H270KC	27PF, 50WV, ±10%, Ceramic	1	
C6	ECCD1H470KC	47PF, 50WV, ±10%, Ceramic	1	
C1	ECCD1H680KC	68PF, 50WV, ±10%, Ceramic	1	
C20	ECQS05141JZ	140PF, 50WV, ± 5%, Styrol	1	
C12	ECKD1H122ZF	0.0012μF, 50WV, $\pm^{80}_{20}$%, Ceramic	1	
C5	ECKD1H102MD	0.001μF, 50WV, ±20%, Ceramic	1	
C19	ECKD1H472MD	0.0047μF, 50WV, ±20%, Ceramic	1	
C7, 18, 25 41, 43	ECKD1H103ZF	0.01μF, 50WV, $\pm^{80}_{20}$%, Ceramic	5	
C34, 35	ECKD1H223ZF	0.022μF, 50WV, $\pm^{80}_{20}$%, Ceramic	2	
C24	ECFVD223MD	0.022μF, 50WV, ±20%, Semi-conductor	1	
C31, 42	ECFVD333MD	0.033μF, 50WV, ±20%, Semi-conductor	2	
C27, 32	ECFVD473MD	0.047μF, 50WV, ±20%, Semi-conductor	2	
C33	ECEA2AS010	1μF, 100WV, Electrolytic	1	Ⓢ
C30	ECEA1JS4R7	4.7μF, 63WV, Electrolytic	1	Ⓢ
C28	ECEA1CS100	10μF, 16WV, Electrolytic	1	Ⓢ
C37	ECEA1CS470	47μF, 16WV, Electrolytic	1	Ⓢ
C29, 36	ECEA1CS221	220μF, 16WV, Electrolytic	2	Ⓢ

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
CABINET				
	RYMF504X0	Cabinet Body Assembly,(Black)	1	○
	RYMF504X2	Cabinet Body Assembly,(Red)	1	○
CA1	Not Available Order RYMF504X0 or RYMF504X2	Cabinet Body Only,(Black) Cabinet Body Only,(Red)	(1) (1)	
CA2		Grill, Speaker	(1)	
CA3		Panel	(1)	
CA4		Scale, Dial	(1)	
CA5	RKK123Z0 or 2	Cover, Battery(Black, Red)	1	
CA6	RKH008TZ0 or 2	Handle Strap(Black, Red)	1	○
CA7	RBT005TZ	Knob, Tuning	1	
CA8	RBV89-1	Knob, Volume	1	
	RYFF504X0 or 2	Cover, Cabinet Body Assembly(Black, Red)	1	○
CA9	Not Available Order	Cover, Cabinet Body Only,(Black, Red)	(1)	TAMACO
CA10	RYFF504X0 or 2	Name Plate	(1)	
CA11	XEAR116EAY	Telescopic Antenna, 4 Steps, 400mm	1	
CA12	RJC008TZ	Terminal, Battery ⊕ & ⊖ Side	1	
CA13	RJC202TZ	Terminal, Spring ⊖ Side	1	
CA14	RJC717TZ	Terminal, ⊕ Side	1	
	RJC702TZ	Terminal	1	
	RHM002TZ	Bracket, Handle	1	
	RDY025TZ	Shaft, Knob	1	
	RHR688Y	Cushion, Battery	1	
	XSM26D6BNS	Screw Antenna	1	
CHASSIS				
CH1	RJJ19Z	Terminal, Antenna	1	
CH2	RJT004TZ	Jack, Earphone	1	
CH3	RDE001TZ	Pointer Base	1	
CH4	RDH007TZ	Pointer, Dial	1	
	XTM3+8C	Screw, Dial Pointer	1	TAMACO
	XWG3	Washer, Dial Pointer	1	
	XSM26D4	Screw, Variable Capacitor Mtg	2	
ACCESSORY				
A1	XEH1A1-P	Earphone, Impedance 8Ω	1	Ⓢ
PACKING, MATERIALS				
P1	RPK703Y	Gift, Box	1	○
P2	RPP028	Polyethylene Cover, Set	1	TAMACO
P3	RPN2747Z	Pad	1	

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